1882MNRAS..42R.358P

Finally, during the whole nearly of April and May of the present year faculæ of unwonted extent and brilliancy have been visible on the disk, being plainly traceable sometimes to a distance of from five to six minutes of arc from the limb, instead of from about three to four minutes only, which latter are about the limits wherein they are more generally to be seen. Is it not therefore probable that simultaneously with greatly increased solar activity, as indicated by the spots, the faculæ are also upheaving the solar photosphere in mountainous billows of unusual altitude?

The Great Sun-spots of April. By Henry Pratt, Esq.

Having secured a series of photographs of the grand display of spots on the Sun's southern hemisphere, I send copies of some of them with this, although not as good as I desired.

By measures taken from the negative of April 18, 2 P.M., it appears that the total length of the group containing the grandest spot extended to a distance of about 3′, while the diagonals of the principal spot (which formed a rude square) equalled 2′ 7″, or about 59,000 miles, and 1′ 57″, about 52,000 miles, the average length of its sides being 1′ 35″, about 43,000 miles. The total length of the other group reached 2′ 52″, about 76,000 miles.

From a comparison between the negative taken on April 20, 9.20 A.M., and that last referred to, it appears that the great spot had not only considerably altered in form (so that the Maltese cross-like markings had disappeared), but that its length had diminished, whilst its breadth had remained nearly constant. The total length of the last-described group had increased, while an enormous development had taken place between the two principal spots, which had previously been separated by a space almost free from penumbra.

18 *Preston St., Brighton.*

On the Nebula near Merope. By T. W. Backhouse, Esq.

Mr. Burnham having expressed a doubt as to the existence of this nebula, I looked for it on February 13, about 10.15 P.M., with my 4¼-in. Refractor, and a power of 38. I had sometimes looked for it before, but never carefully, and had never seen it. In order that I might be unbiassed, I avoided looking at the descriptions of it in the *Monthly Notices* previous to looking for it. I did not even know which star was *Merope.* I soon found the nebula, though to see it well it was necessary to have

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1882MNRAS..42..359C

Merope out of the field. It was very faint, and the only definite feature was the *f* edge, which, however, was quite plain. I carefully noticed its position among the stars, and afterwards looked at the *Monthly Notices*, vol. xl., and found that its position was almost exactly the same as in Tempel's drawing, p. 622. Taking the squares in that drawing to be 15′ in length, the two brightish stars in it at about 5′ and 10′ off *Merope* were upon the *f* edge; while the bright star about 16′ off *Merope* was outside it, rather further off it than in Tempel's sketch, only I suspected that the nebula came up to that star, but more faintly.

Mr. Common's drawing, page 376, appears to be very rough, or perhaps he has confounded two stars, for his principal nebula does not touch the nebula as I saw it: indeed, the sky is perfectly dark where he draws it.

On February 18 I looked for the *n* edge of the nebula, but could not detect it with any certainty, owing to the brightness of the neighbouring stars; *Electra* at least being in the field at the same time.

Sunderland:
1882, *April* 25.

Determination of the Orbit of η Cassiopeiæ. By J. B. Coit, Esq.

(*Communicated by the Astronomer Royal.*)

I have recently completed a determination of an orbit for this beautiful binary, and a comparison of the same with all the observations at my command.

Before giving my results I would offer a few suggestions concerning the work, which, to my mind, is most needed in the line of double-star observations.

There is at present a manifest tendency upon the part of many to encourage the search for new pairs, to the neglect of the old binaries of Herschel and Struve. It is undoubtedly desirable that our catalogue of multiple stars should be extended as far as possible, in order that we may investigate the law of their distribution. At the same time, however, it is of primary importance that the orbits of several binaries be determined with all possible precision, for by this means alone can we hope to discover the laws which govern their motions, and the forces that rule in these sidereal systems. To accomplish this, the computer needs multiplied observations, with all the data that can enable him to properly determine the relative weight of each measurement.

I suggest, then, that all the systematic labour possible be centred upon a definite list of binaries, representing fairly the different classes, as to period, eccentricity, &c., as already approximately determined. If this work were faithfully done, though the present generation might see but little of the fruits

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